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Preventing wetland soils and sediments from burning on the Swan Coastal Plain: workshop outcomes and conclusions

R Smith [1] & P Horwitz [2]

[1] Fire and Emergency Services Authority
480 Hay Street, Perth, WA 6000.
[2] School of Natural Sciences, Edith Cowan University
100 Joondalup Drive, Joondalup, W.A., 6027.
✉ RSmith@fesa.gov.wa.au; p.horwitz@ecu.edu.au

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Introduction

The workshop sought to review the social and environmental impact of fire on organic-rich soils and sediment and how best to mitigate the risk or reduce the consequences of the fires, in the light of the significant conundrums fire managers face. The objective of the workshop was to collectively consider the relevant scientific and technical information on organic-rich soils and sediments provided by a range of presenters, and then to have the audience participants determine a range of alternative prevention or responses, to protect the soils and minimise their vulnerability to fire. High on the priority list was a recognised need to prevent fires from entering wetland soils or sediments. Further considerations included the needs of both the built and the natural environments.

In convening the workshop, representatives from the Fire and Emergency Services Authority (FESA) and Edith Cowan University (ECU) identified that these issues needed to be addressed by a reasonably broad spectrum of people, including experts in areas associated with organic-rich soils and ecological processes, bush fire managers and community members. The workshop followed invited paper presentations which provided the necessary technical information (the papers published in this issue). The workshop then sought the attendees' participation to prepare some recommendations for more effective consideration of issues raised by fires in these habitats.

Specifically, participants were placed at predetermined seating at tables (seven tables consisting of six persons per table, each person at the table from a different agency or organisation). Each table was then asked to examine a range of scenarios concerning fire and wetlands, and to record their findings. These records are summarised here.

Workshop outcomes

Two principal recommendations were made by workshop participants. The first related to more appropriate management of the superficial aquifers on the Swan Coastal Plain. The second was for more effective and broadly based fire management planning to occur.

1. Management of the superficial aquifers on the Swan Coastal Plain

An issue consistently raised by presenters and workshop participants was the sustainability of the current superficial aquifer management and the way the sites with organic-rich soils and sediments are no longer being seasonally inundated with the winter rains and saturated during drier months. Participants felt unable to make specific recommendations other than 'more appropriate management' involving careful consideration of local drawdown effects resulting from local groundwater abstraction activities where such sites occur, and calling for decision makers to recognise the significant consequences of overall groundwater drawdown for such sites.

2. Fire Management Plans

The principal requirement raised by each working group was for more effective planning to prevent fires from entering organic rich wetland soils or sediments. Fire management plans were seen to be the most useful tool in this regard, and it was consistently argued that the following elements need to be covered in such plans:

A. Mapping of susceptible soils and sediments

B. Community participation

C. Maintenance of moisture levels in wetlands

D. Hazard reduction practices

E. Fire response plans

Other components of the fire management plan would include asset protection (both private property and environmental assets), and people management for smoke contamination, traffic and fire fighter access. People management includes the identification of community stakeholders and utilising their skills and knowledge, and of paramount importance is the safety of the community. In addition the areas of fire management planning where there is an information deficiency will be identified, and where possible, action taken to correct the deficiency.

A. Mapping of susceptible soils and sediments

Improved diagnostic capabilities for sites with vulnerable organic-rich soils and sediments provided in this issue (Semeniuk & Semeniuk 2005, this issue) gives fire managers the capacity to identify critical sites through mapping, an essential precursor for

preparedness, prevention and recovery objectives and strategies. Once the organic-rich sites are identified there is also an opportunity to map and develop strategic access tracks. In addition, to provide access, tracks could compartmentalise the various vegetation areas, for example the delineation and separation of organic sites from surrounding areas.

A component of the fire management plan should also include risk mapping and options to mitigate that risk. This hazard identification must be a genuine appreciation of the total hazards and values at risk. The utilisation of the predetermined protection of life, property and environment plan must be comprehensive enough to ensure the specific values identified are appropriate. There may be a need to prioritise certain areas that leads to some property values being compromised initially to prevent the bush fire entering the high organic soils areas. Once a fire commences in these vulnerable sites it may pose a longer term risk to lives, homes and community values such as smoke free air.

B. Community participation

As community values will be at risk it was considered essential to ensure local engagement in the process of planning. A community awareness and education strategy implemented for all stakeholders was regarded as a key step. A component of that community awareness could include the surveillance and vigilance of critical, identified sites by landowners or neighbours. This vigilance could include early reporting of smoke sightings and also surveillance for suspicious activities that should be passed to Crime Stoppers. The target groups for the community awareness and education must include the general public, local residents, staff from all relevant State and local governments, fire fighters and nature conservation groups. The mediums to be used to ensure that the awareness and education information gets to the appropriate audiences must include local public meetings, local newspapers, posters, radio, television and the internet. Workshop participants highlighted the need for specialised programs for residents and landowners who live adjacent to wetland areas.

C. Maintenance of moisture levels

In some instances, there may be a need to consider artificial water level management of the sites to ensure that the moisture content of the organic-rich soils does not drop to a level that will sustain ignition. This may include the albeit very expensive option of flooding critically important sites, or sites where risk to other values is particularly high, to sustain them over periods of drought or periods during which they are vulnerable to burning.

D. Hazard Reduction

The fire management plan may also need to have a hazard reduction plan developed so that inappropriate hazard reduction work is not undertaken. If an option such as prescribed burning is deemed to be inappropriate at that specific site, then the fire management plan needs to ensure that the reasons why the hazard reduction method is not appropriate are recorded. Simultaneously it should also record what the boundaries are of the restrictions on those activities. Alternatively if a hazard reduction method is preferred then that option also needs to be clearly described along with reasons why that option was chosen and specifying the appropriate constraints on its application. For example if slashing is considered an appropriate activity in the bush land adjacent to wetlands, plans need to be prescriptive: how to slash, the extent and relative distances from the sites to be protected, and how to manage the dead and down vegetation.

E. Fire Response Plans

Fire response plans are important as they provide a pre-determined tool to ensure that fire fighters are able to respond appropriately to meet the fire, and the social and environmental needs of sites. Given the special nature and specific needs of these sites it is important to ensure values are not compromised through a lack of communication. Some of the response measures that should be considered for appropriateness include:

- fire breaks,
- the use of fire suppressants,
- the application of trenching machines and/or
- the strategic placement of bores to prepare for flooding.

Preferred options should be done in the light of a full consideration of the benefits and costs, both financial and environmental needs. Included in this analysis must be the costs of mitigating the environmental damage that may result as a consequence of suppressing the fire (for instance the water quality implications; Horwitz & Sommer 2005, this issue) and also the consequences of leaving a fire to burn until conditions other than human intervention (*i.e.*, rainfall or elevation of groundwater levels) resulted in its suppression.

A consideration of the fire response plan must be whether the community and environmental values would be better protected by allowing the site to be burnt until nature provides rainfall and raises the soil moisture content. The vexed nature of this question: whether to actively suppress the fire or not, whether to use suppressants or not, whether to trench or not, will inevitably result in some people feeling disenfranchised by decision making, again stressing the importance of involving stakeholders in planning processes.

Some further considerations for fire managers

The development of fire management plans and fire response plans should improve the potential to protect the community and the environmental values. While it is desirable to have these plans developed in the short term, the need for additional information that will become available through research recognised as important by workshop participants may result in the development of some plans being delayed.

During the workshop it was consistently identified that community participation and communication is essential. FESA currently operates a system of urban bushland fire response plans, that have community participation. It may be possible to expand that system to cover sites with organic-rich soils and sediments.

It is important that the community recognises that FESA will be undertaking bush fire suppression work with the best will to minimise environmental, social and community damage. In many bush fires there will be some potential damage to each component. It should also be acknowledged that bush fires are suppressed by people using their judgement and skills in difficult conditions, against an unpredictable natural event, bush fires. People who review the performance of fire managers must consider the events as a whole and not in individual components, as there will be positives and negatives in each component.

References

Horwitz P & Sommer B 2005 Water quality responses to fire, with particular reference to organic-rich wetlands and the Swan Coastal Plain: a review. Journal of the Royal Society of Western Australia 88: 121–128.

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